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quality, being prepared by the Maoris. In 1870, there was sold in the London market four thousand tons of Phormium fibre; this, however, was of an inferior quality, having been imperfectly prepared by machines. Its principal use is, at present, in the manufacture of ropes, for which purpose it is usually mixed with manilla. Numerous chemical means have been resorted to for obtaining the fibre, but without satisfactory results. Thus far civilized man, with all his array of machines and engines, has been unable to do the simple work of cleaning the Phormium fibre as well as the tattooed cannibal did with a sea-shell.

THE AVAILABILITY OF CERTAIN BARTRAMIAN NAMES IN ORNITHOLOGY.

BY J. A. ALLEN.

UNDER the caption "*Fasti Ornithologiæ Redivivi. — No. I.* Bartram's *Travel's*," Dr. Elliott Coues has recently¹ attempted to revive sundry of Bartram's names of the birds of the United States, on the ground of their priority. Dr. Coues assumes that Bartram was "on principle binomial, occasionally lapsing;" and that "if his occasional slips are to count against him, then not a few great modern ornithologists must also be ruled out; among whom may be instanced Schlegel, Bonaparte, Sunde-vall, and others, in whose writings are found trinominal names," etc. "But the count against him [Bartram] for nearly a century," says Dr. Coues, "is not a true bill; the verdict must be, if not reversed, radically modified." Since a few of Bartram's binomial names have come into current use, whilst others are commonly cited in synonymical lists, Dr. Coues claims that if Bartram is entitled to anything, he has not received what is rightfully his due, and if not entitled to anything we have given him tribute to which he has no claim. Dr. Coues adopts the former alternative, and on the ground of consistency advocates the adoption of all of Bartram's binomial names that can be identified, in cases where they happen to have priority, whether they are accompanied by descriptions or not.

Before accepting fully the results that follow such premises, let us examine a little into the nature of Bartram's work. The ornithological matter contained in Bartram's *Travels* is notably of two kinds. In the general narrative he has at sundry

¹ Proc. Acad. Nat. Sci., Phila., 1875, pp. 338-358, September, 1875.

places described not only the habits and distribution of some of the birds he met with in his travels, but has given more or less careful descriptions of the birds themselves, designating them also by binomial names. In addition to this he has given, at pages 288-296, a nominal list of two hundred and fifteen species, in which he has usually mentioned the species under Latin binomial names, to which he has added an English name; occasionally to the Latin names he has appended a few words of description, also in Latin; while certain typographical signs are prefixed to denote the places of residence of the different species and their migrations. These signs, with the simple names, constitute in most cases all that approaches to a description of the species that Bartram has given; yet the attempt is now made to establish priority for these names, on the ground that the species thus designated were sufficiently described to substantiate the claim, and to set them up in place of names backed by good description and thoroughly familiar through long use.

In this list of two hundred and fifteen species, quite a number of names prove to be synonymous with others; thirty-six are given by Dr. Coues as "undetermined," and ten or a dozen more are only guessed at; leaving fully one fifth of the whole number almost hopelessly in doubt. In addition to this there are thirty-five or more *polynomial* names. Of the one hundred and eighty species of the names of which Dr. Coues attempts to give the present equivalents, nearly all had been previously described in the *Systema Naturæ* of Linnæus, a work that must have been accessible to Bartram if any European book on natural history could be; and that it was so is evident from his references to it in the botanical portions of his work. Bartram has, in fact, in some groups employed a large proportion of Linnæan names, while in others he has either altogether ignored them or was ignorant of them. Of his twenty-two species of rapacious birds, all but three of the recognizable species were already in the *Systema Naturæ*, yet only *five* of them appear under the Linnæan names; of his seventeen remaining names only *one*, *Vultur atratus*, is strictly entitled to recognition. Of the rest of the land birds, numbering one hundred and seven species, a dozen of the names are either polynomial, synonyms, or undeterminable, while of the remaining ninety-five, eighty of the species had been previously named and described in the *Systema Naturæ*, or by other writers preceding Bartram; yet less than half of these names were used by Bartram, who instead gave

new names of his own. In the rest of the list, embracing the wading and swimming birds, the case is even still worse. Of these, numbering eighty-five species, nineteen are given by Dr. Coues as "undetermined;" fifteen others are guessed at only, three are synonyms, and fifteen of the names are polynomial! Of the thirty-three binomially named species determined by Dr. Coues, twenty-eight had been described in the *Systema Naturæ*; of the remaining five, Dr. Coues regards three as available. Finally it appears that after excluding from Bartram's list of two hundred and fifteen species the synonyms, the polynomial names, and the undeterminable ones, we have left but one hundred and forty-six, or about two thirds of the whole; and that of these one hundred and thirty, or thereabouts, had been named and described several years prior to the publication of Bartram's work, mainly, too, in the *Systema Naturæ*, a book that to Bartram must have been one of the most accessible works on natural history.

Dr. Coues, however, has indicated twenty Bartramian specific names and one generic name which he claims must be adopted, in order that Bartram may have his due as one of the fathers of American ornithology. We are, of course, not to judge the scientific works of a century ago by our present standards, but making due allowance for the two periods, it would seem that in the recognition Bartram has already had, he has been most fairly dealt with, and that further claims for him will only call forth a more rigid criticism of his merits as an ornithological writer than his work will well bear. Ten of these twenty-one Bartramian names, however, Dr. Coues claims, have been for a long time currently in use, six of them having been "erroneously" attributed to Wilson and one to Audubon. The remaining ten Dr. Coues proceeds to newly "set up."

But let us examine Bartram's work still further. First, respecting Bartram as a binomialist: we find that out of two hundred and fifteen names in his list thirty-six are not binomial, or more than *one in seven*, — pretty frequent lapses for a "binomialist on principle." Secondly, we find that the Bartramian names already in current use or quoted as synonyms belong to species that he not only binomially named, but to species which he more or less fully described in his narrative, though some, it is true, are taken from among those of his list. Thirdly, it seems that the species for which Bartramian names have been currently employed, but "incorrectly" attributed to Wilson or

Audubon, were never described, in any true sense, by Bartram, and would be undeterminable if their recognition depended on anything in Bartram's work. We have in nearly every case only the name, which, being a characteristic one, is presumably referable to the species to which it was subsequently applied by Wilson or Audubon, who were the first to give anything which, by any reasonable license, can be construed as a "description" of the species in question. In most cases Wilson may have obtained the names directly from Bartram, since, as is well-known, William Bartram was not only the friend of Wilson, but his associate and instructor in natural history; and it is hardly presumable that Wilson did not know, through personal intercourse with Bartram, the birds the latter had named in his Travels.¹ Besides this, the natural applicability of the names to the species in question may have rendered the names in a measure traditionally current. Other names which have not that happy suggestiveness, but which are in all other respects wholly parallel, figure prominently in the long list of Bartram's species that Dr. Coues, with all his ability as an ornithological expert, has had to give as "undetermined." The specific name *palustris*, when applied to a sparrow or a wren, may be distinctive when it happens that only one species of the group to which the species belongs affects marshy situations, but as soon as a second is found, the name of course has then no distinctive value. Coincidences of this kind are all that make *many* of Bartram's names determinable; and this merely chanced to be so, happening otherwise, however, in numerous instances, as witness the in other respects parallel cases of "*Falco pullarius*, the chicken hawk," "*F. gallinarius*, the hen hawk," "*Fringilla canabina*, the hemp bird," "*Calandra pratensis*, the May bird," etc. Fourthly, the remarks above given under "thirdly" are also strictly applicable to nearly all of the Bartramian names newly set up by Dr. Coues, these being determinable only by negative evidence and not by anything inherent in Bartram's work, — simply through a process of exclusion by virtue of a full knowledge of the avi-fauna of the region in question; by knowing that they cannot well refer to anything else. For nearly or quite half a century after Bartram wrote, such a thing would have been impossible, simply from lack of this necessary knowledge of the fauna of the region to which Bartram's work refers.

¹ In the case of Audubon, the single instance of the use of the same name may perhaps be properly regarded as a coincidence.

Lists like Bartram's are not of rare occurrence, where the authors, not having the means of readily determining the species, or not caring to take the trouble to do so, give the correct names when they happen to know them, and prefer coining names for the others as the easiest way out of a difficulty.

Finally, let me ask students of zoölogy — for the principle involved is not, of course, limited to ornithology — if searching for old names, which, like those of Bartram's, can only be determined by the process of exclusion, with which to supplant long-established ones, intelligently proposed and backed by adequate descriptions, tends to the best interest of science? If the example Dr. Coues is here setting is to be followed, there will be no stability to our nomenclature for a long time, but only, except perhaps to a few experts, the most perplexing confusion. The advocacy of such revolutions on the score of *justice* is, it seems to me, calling things by wrong names, robbing, as it does, intelligent workers of the recognition justly their due, whenever circumstance may favor the deciphering of the hieroglyphics of earlier slovenly or ignorant writers, of which their own works would never afford an interpretation. Such researches may be of interest from an antiquarian point of view, but they should end with their legitimate results, and not be pushed with a view of overturning long-settled names in zoölogical nomenclature. I herewith append a list of the Bartramian names (given in quotation marks) which Dr. Coues wishes to see set up, with the nomenclature resulting from his determinations, together with their usual equivalents, and with a few critical remarks on special points.

1. "VULTUR ATRATUS, black vulture or carrion crow" = *Carthartes atratus* (Bartr.). Elsewhere well described.

2. "FALCO GLAUCUS, the sharp-winged hawk, of a pale sky-blue color, the tip of the wings black" = *Elanus glaucus* (Bartr.) Coues = *E. leucurus* auct. Otherwise further described.

3. "FALCO SUBCERULIUS, the sharp-winged hawk, of a dusky blue color" = *Ictinia subcæruleus* (Bartr.) Coues = *I. Mississippensis* auct. Otherwise further described.

4. "CORVUS CARNIVORUS, the raven" = *Corvus corax*, var. *carnivorus* (Bartr.) B. B. and R. Adopted in 1858 by Baird, but Bartram's whole description consists of the names here given in quotation marks, with a mark prefixed denoting that it is one of the species that "arrive in Pennsylvania in the *spring* season, from the *South*, which, after building nests and rearing their young, return again *southerly* in the *autumn*." At page

179 Bartram speaks of seeing "the vultures and *ravens* crouched on the crooked limbs of the lofty pines," etc., in East Florida. Is Dr. Coues willing to extend the former range of the raven over East Florida, and admit it as a *summer migrant from the South* to Pennsylvania, accepting Bartram as authority, and amend his ornithological writings to correspond? Consistency certainly calls for this if we adopt Bartram's name, and "consistency is a jewel," says our author.

5. "CORVUS MARITIMUS, the great sea-side crow or rook" = *Corvus maritimus* Bartr. = *C. ossifragus* Wils. Based on the name and the indication of its habitat, though "great," as compared with the others, is erroneous. The ambiguity that overshadows *C. carnivorus* throws additional doubt upon the identity of *C. maritimus* with *C. ossifragus*.

6. "CORVUS FRUGIVORUS, the common crow" = *C. frugivorus* Bartr. = *C. Americanus* Aud. Based on the name alone and "exactly parallel," says Dr. Coues, with the case of the raven.

7. "CORVUS FLORIDANUS, pica glandaria minor, the little jay of Florida" = *Cyanocitta Floridana* (Bartr.) Bon. = *Aphelocoma Floridana* (Bartr.) Cab. At page 212 distinguished from *Cyanura cristata*.

8. "GRACULA PURPUREA, the lesser purple jackdaw, or crow blackbird" = *Quiscalus purpureus* (Bartr.) Cass. This rendering is evidently not tenable, since the *Gracula quiscula* of Linnæus (1758), as shown by his description in the *Systema Naturæ*, refers to this species and not to *Q. major*, though possibly some of the references may. Hence if *quiscula* is to be used for either of the *Quiscali*, it must be used for *purpureus* and not for *major*, although Bartram employed it for *Q. major*, and on this ground Dr. Coues suggests its adoption for that species.¹

9. "CERTHIA RUFA, little brown variegated creeper" = *C. familiaris*, var. *rufa* (Bartr.) Coues, "with those who separate the bird from the European" = *C. Americana* auct.

10. "CERTHIA PINUS, the pine creeper" = *Dendrocæa pinus* (Bartr.) Bd. "The name," says Coues, "is universally attributed to Wilson, but we see here its original source." Are we quite

¹ "GRACULA QUISCULA, the purple jackdaw of the sea-coast" Bartram. Dr. Coues says, "The expression 'purple jackdaw of the sea-coast' is perfectly diagnostic, the species being thoroughly maritime and always called jackdaw in the countries it inhabits." It, however, shares the name "purple jackdaw" with *Q. purpureus*, see Catesby and subsequent early writers. "To those to whom," Dr. Coues continues, "such alliterative names as *Sialia sialis*, *Cupidonia cupido*, etc., are unobjectionable, I suggest the propriety of calling this species *Quiscalus quiscula*."

sure? Is it not more likely to be the *Helminthophaga pinus*, which is the "pine creeper" of Catesby, and the *Certhia pinus* of Linnæus, since Bartram often quotes Catesby, even in his list, and many of his trinomials and English names are the same as those of Catesby, and evidently adopted from Catesby.

11. "LUCAR LIVIDUS, apice nigra, the cat bird or chicken bird" = *Lucar Carolinensis* (Bartr.) Coues = *Mimus Carolinensis* auct. Dr. Coues, presuming "apice nigra" was intended to read "vertice nigra," which of course is probable, adopts the name *Lucar*, though "probably meaningless" and looking "like a misprint," for the generic name of the cat bird, as being coequal with *Felivox* of Bonaparte and *Galeoscoptes* of Cabanis, and as equivalent to *Mimus* in case the cat bird and mocking birds are to be placed in the same genus.

12. "MELEAGRIS AMERICANUS, the wild turkey" = *Meleagris gallopavo*, var. *Americana* (Bartr.) Coues. As it is fully described at pages 14 and 83, and binomially named on page 83 as *Meleagris occidentalis*, this, if either of Bartram's names is to be adopted, is the one which, according to the rule of priority, must be adopted, *M. occidentalis* having the precedence of over two hundred pages in Bartram's work. Hence we have *Meleagris gallopavo* var. *occidentalis* (Bartr.)! The name *occidentalis* was evidently given in allusion to its being an inhabitant of the western world, as he compares it with the *Meleagris (Numida meleagris)* of Africa.

13. "CARDUELUS PINUS, the lesser goldfinch" = *Chrysomitris pinus* (Bartr.) Bon. First described by Wilson under the same specific name, which name, as Dr. Coues observes, has been usually attributed to the latter author. Bartram's right to priority rests solely on the Latin and English names above given, which may be presumed to apply to *Chrysomitris pinus* auct.

14. "PASSER DOMESTICUS, the little house sparrow or chipping bird" = *Spizella domestica* (Bartr.) Coues = *Spizella socialis* auct. This is another of the lucky cases where the name alone seems to determine the species with probable certainty.

15. "PASSER PALUSTRIS, the reed sparrow" = *Melospiza palustris* (Bartr.) Bd. First described by Wilson under the same specific name, to whom the name has heretofore been attributed, but is now transferred by Dr. Coues to Bartram, because he presumably used the name for a swamp sparrow, and because we chance to have but one!

16. "PASSER AGRESTIS, the little field sparrow" = *Spizella*

agrestis (Bartr.) Coues = *S. pusilla* auct. First described by Wilson under the specific name *pusilla*, unless it be Gmelin's *Motacilla junco*, as some have supposed possible. Several of our sparrows would better bear the epithet "little field sparrow" than this; as, for example, *Poocetes gramineus* and *Coturniculus passerinus*, and also *Passerculus savanna*, unless the latter should be considered too northern for the asterisk in Bartram's list. *Spizella pusilla*, though now known as "field sparrow," is only found in fields bordered with thickets or partly overgrown with bushes.

17. "MOTACILLA DOMESTICA (*regulus rufus*), the house wren" = *Troglodytes domestica* (Bartr.) Coues = *T. ædon* auct. Without the English name "house wren," "*Motacilla domestica*" would be wholly undeterminable.

18. "MOTACILLA PALUSTRIS (*reg. minor*) the marsh wren" = *Cistothorus palustris* (Bartr.) Bd. First described as *palustris* by Wilson, to whom, as Dr. Coues says, this Bartramian name has usually been attributed; but why is not Bartram's *palustris* as likely to be *Cistothorus stellaris* as anything else?

19. "ARDEA MUGITANS, the marsh bittern, or Indian hen" = *Botaurus mugitans* (Bartr.) Coues = *Botaurus lentiginosus* auct. Can the above names be allowed as a basis for priority, "the marsh bittern" being the only really descriptive part?

20. "TANTALUS PICTUS (Ephouskyka Indian), the crying bird, beautifully speckled" = *Aramus pictus* (Bartr.) Coues = *A. giganteus* auct. Elsewhere fully described.

21. "COLYMBUS FLORIDANUS, the great black cormorant of Florida, having a red beak" = *Graculus Floridanus* (Bartr.). First described by Audubon under the same specific name, probably merely by a coincidence. The "red beak" Dr. Coues explains as a lapse of memory for "red gular pouch and lores."

From the foregoing it will be seen how very slight are the claims Bartram's names have to priority over those in current use. Of the twenty-one given above, Nos. 1, 2, 3, 7, 11 (the generic name only), 12 (*occidentalis*, not *Americana*), and 20, — six or seven in all, — are the only ones that, in justice to all parties, can rightfully stand. One (No. 10) has been shown to be almost unquestionably Linnæan, not Bartramian.

In conclusion, I would suggest to the author of the article under review, who seems so zealous in the vindication of a truly sagacious naturalist, the propriety of also claiming for him priority in the discovery of the geographical law of variation in size in North

American mammals, — a law it took naturalists fifty years longer to develop and formulate, — since Bartram repeatedly alludes to the smaller size of animals of the same species in Georgia and Florida than in Pennsylvania, especially the wolves, deer, foxes, “and other animals.” At page 216 of his *Travels*, for instance, after referring to the small size of the horses of Florida, he says, “It is a matter of conjecture and inquiry, whether or not the different soil and situation of the country may have contributed in some measure in forming and establishing the difference in size and other qualities betwixt them. I have observed the horses and other animals in the high hilly country of Carolina, Georgia, Virginia, and all along our shores, are much larger and stronger than those bred in the flat country next the sea-coast; a buckskin of the Upper Creeks and Cherokees will weigh twice as heavy as those of the Siminoles or Lower Creeks, and those bred in the low flat country of Carolina.”

THE HARVARD SUMMER SCHOOL OF GEOLOGY.

BY PROFESSOR N. S. SHALER.

THE first session of this, the last to be established of the several schools for summer teaching which have been originated by the officers of Harvard University, held its first session at Cumberland Gap, Kentucky, during the past summer. The design was to give practical field instruction in geology to teachers and others of some training in science and general culture, who might desire to acquire the methods of such work. The Governor of Kentucky having given an invitation to the President of Harvard College to place the school in Kentucky, and having offered the coöperation of the Kentucky Geological Survey, the school was established at Cumberland Gap, within the State of Kentucky but near to the state lines of Tennessee and Virginia. Though remote from the routes of travel, this point offered peculiar advantages for the study of stratigraphic, topographical, and dynamic geology. The structure of the Appalachian mountain system is exceedingly well shown at this point; the section extends from the lower Potsdam sandstone to the middle coal measures, giving about twelve thousand feet of beds within forty miles of distance; a wonderful system of faults of different ages bring these beds to view at many different points and enable the student to observe them under varied conditions; a short distance away, within plain